CTEH® CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH, LLC

Mission Incident
Santa Paula, CA
Preliminary Summary of Air Monitoring Results
November 30, 2014

Prepared by
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CTEH® CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH, LLC

Introduction

Center for Toxicology and Environmental Health, LLC (CTEH®) continued air monitoring in support of response activities following a vac truck explosion and fire in Santa Paula, CA.

This submittal summarizes air monitoring data for November 30, 2014 07:00 to December 01, 2014 07:00.

Real-time Air Monitoring

All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Manually-logged real-time air monitoring was conducted for chlorine (Cl_2), hydrogen sulfide (H_2S), percent of the Lower Explosive Limit (LEL), oxygen (O_2), peroxides, sulfur dioxide (SO_2), sulfuric acid (H_2SO_4), particulate matter (10-micron particles, PM_{10}), and volatile organic compounds (VOCs), with instruments such as Gastec® pumps with chemical-specific colorimetric tubes, RAESystems® MultiRAE Plus and MultiRAE Pro PID with chemical-specific sensors, and TSI® AM510s for particulate matter. Monitoring was conducted by CTEH® personnel in the work area, at fixed locations in the surrounding community, and along the perimeter of the facility in the community. Table 1 summarizes monitoring data for manually-logged real-time readings. Maps including the site location, fixed community real-time air monitoring locations, aerial site photo, and roaming monitoring are included in Appendix A.

CTEH® monitored RAESystems© AreaRAE units with ProRAE Guardian system at four locations on the fence line of the facility within the work area. AreaRAEs were equipped with sensors to detect VOCs, LEL, H_2S, and SO_2. AreaRAE Unit 02 readings up to 3% LEL were confirmed as sensor drift by field personnel with handheld monitors, and the sensor was recalibrated. Table 2 summarizes monitoring data for AreaRAE monitoring. AreaRAE graphs displaying real-time air monitoring data as well as 15-minute rolling averages and a map depicting AreaRAE locations are included in Appendix B.

Additional particulate monitoring was conducted around the facility perimeter within the work area. TSI AM510 SidePak aerosol monitors equipped with 10-micron impactors were collocated with the AreaRAE units. Data-logged readings from AR04 for PM_{10} reported readings of 0.36 mg/m^3 to 8.76 mg/m^3 from 2056 to 2107 on November 30, 2014; data-logged readings from AR01, AR02, and AR03 at this time did not indicate elevated levels of PM_{10}. Table 3 summarizes monitoring data for data-logged AM510 units.

Table 1: Manually-Logged Real-Time Air Monitoring Summary[1]
November 30, 2014 07:00 – December 01, 2014 07:00

Location Category	Analyte	Instrument	No. of Readings	No. of Detections	Avg. of Detections	Concentration Range
Community	Cl_2	MR+ / MR Pro	25	0	NA	<0.1 ppm
	LEL	MR+ / MR Pro	26	0	NA	<1 %
	O_2	MR+ / MR Pro	26	26	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	26	0	NA	<0.1 ppm
	PM_{10}	AM510/Dusttrak	26	26	0.007	0.002 - 0.011 mg/m^3
	SO_2	MR+	26	0	NA	<0.1 ppm
	H_2SO_4	Gastec 35	26	0	NA	<0.2 mg/m^3
	VOC	MR+ / MR Pro	26	0	NA	<0.1 ppm
Exclusion Zone	Cl_2	MR+ / MR Pro	1	0	NA	<0.1 ppm
	H_2S	MR+ / MR Pro	1	0	NA	<0.1 ppm
	LEL	MR+ / MR Pro	1	0	NA	<1 %
	SO_2	MR+	1	0	NA	<0.1 ppm
	VOC	MR+ / MR Pro	1	0	NA	<0.1 ppm
Work Area	Cl_2	Gastec 8La	4	0	NA	<0.05 ppm
		MR+ / MR Pro	21	0	NA	<0.1 ppm
	H_2S	MR+ / MR Pro	26	0	NA	<0.1 ppm
	LEL	MR+ / MR Pro	17	0	NA	<1 %
	O_2	MR+ / MR Pro	1	1	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	5	0	NA	<0.1 ppm
	SO_2	MR+	13	0	NA	<0.1 ppm
	H_2SO_4	Gastec 35	4	0	NA	<0.2 mg/m^3
	VOC	MR+ / MR Pro	24	0	NA	<0.1 ppm

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*
[2]*Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.*

Table 2: AreaRAE Air Monitoring Summary[1]
November 30, 2014 07:00 – December 01, 2014 07:00

Unit ID	Analyte	No. of Readings	No. of Detections	Avg. of Detections	Detection Range
Unit 01	H_2S	5400	561	0.3 ppm	0.1 - 1.0 ppm
	LEL	5400	0	NA	< 1 %
	SO_2	5400	0	NA	< 0.1 ppm
	VOC	5400	3	0.2 ppm	0.1 - 0.3 ppm
Unit 02	H_2S	5405	0	NA	< 1 ppm
	LEL	5405	9	3.00%	3.0 - 3.0 %
	SO_2	5405	0	NA	< 0.1 ppm
	VOC	5405	7	0.1 ppm	0.1 - 0.1 ppm
Unit 03	H_2S	5377	78	0.1 ppm	0.1 - 0.2 ppm
	LEL	5377	0	NA	< 1 %
	SO_2	5377	0	NA	< 0.1 ppm
	VOC	5377	0	NA	< 0.1 ppm
Unit 04	H_2S	5360	61	0.1 ppm	0.1 - 0.1 ppm
	LEL	5360	0	NA	< 1 %
	SO_2	5360	0	NA	< 0.1 ppm
	VOC	5360	0	NA	< 0.1 ppm

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*
[2]*Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.*

Table 3: Data-logged AM510 Particulate (PM_{10}) Monitoring Summary[1]
November 30, 2014 07:00 – December 01, 2014 07:00

Serial No.	Location	No. of Readings	No. of Detections	Avg. Detection	Detection Range
10704069	AR01	4710	4558	0.159	0.001 - 0.472 mg/m^3
10704074	AR02	2338	2338	0.008	0.002 - 0.209 mg/m^3
10704072	AR03	2549	2549	0.009	0.002 - 0.029 mg/m^3
11005012	AR04	5417	5417	0.05	0.003 - 8.765 mg/m^3

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*

Appendix A

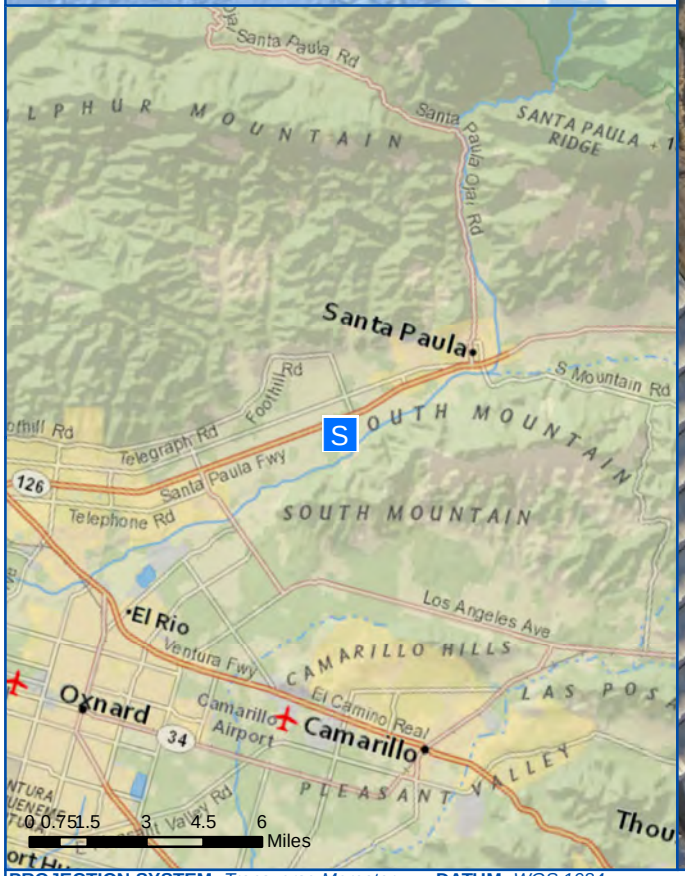
Incident Maps:

Real-time Air Monitoring Locations and Incident Site

Site Location

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura



PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *11/25/2014 9:42:14 AM*

Aerial Overview - 11/30/2014

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *11/30/2014 6:01:27 PM*

Fixed Community Real-Time Air Monitoring Station Locations

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *11/25/2014 12:22:02 PM*

Manually Logged Real-Time Air Monitoring Concentrations

VOC - Nov 30, 2014 07:00 to Dec 01, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *12/1/2014 10:54:16 AM*

Manually Logged Real-Time Air Monitoring Concentrations

H_2SO_4 - Nov 30, 2014 07:00 to Dec 01, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *12/1/2014 11:00:36 AM*

Manually Logged Real-Time Air Monitoring Concentrations

SO_2 - Nov 30, 2014 07:00 to Dec 01, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *12/1/2014 10:57:29 AM*

Manually Logged Real-Time Air Monitoring Concentrations

PM_{10} - Nov 30, 2014 07:00 to Dec 01, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84*

Print Date: *12/1/2014 10:59:13 AM*

Manually Logged Real-Time Air Monitoring Concentrations

Peroxides - Nov 30, 2014 07:00 to Dec 01, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *12/1/2014 10:48:19 AM*

Manually Logged Real-Time Air Monitoring Concentrations

O_2 - Nov 30, 2014 07:00 to Dec 01, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *12/1/2014 11:01:09 AM*

Manually Logged Real-Time Air Monitoring Concentrations

LEL - Nov 30, 2014 07:00 to Dec 01, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *12/1/2014 11:06:17 AM*

Manually Logged Real-Time Air Monitoring Concentrations

H_2S - Nov 30, 2014 07:00 to Dec 01, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *12/1/2014 11:05:38 AM*

Manually Logged Real-Time Air Monitoring Concentrations

Cl_2 - Nov 30, 2014 07:00 to Dec 01, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *12/1/2014 11:03:19 AM*

Appendix B:

AreaRAE Trend Graphs, AM510 Trend Graphs, and AreaRAE/AM510 Air Monitoring Location Map

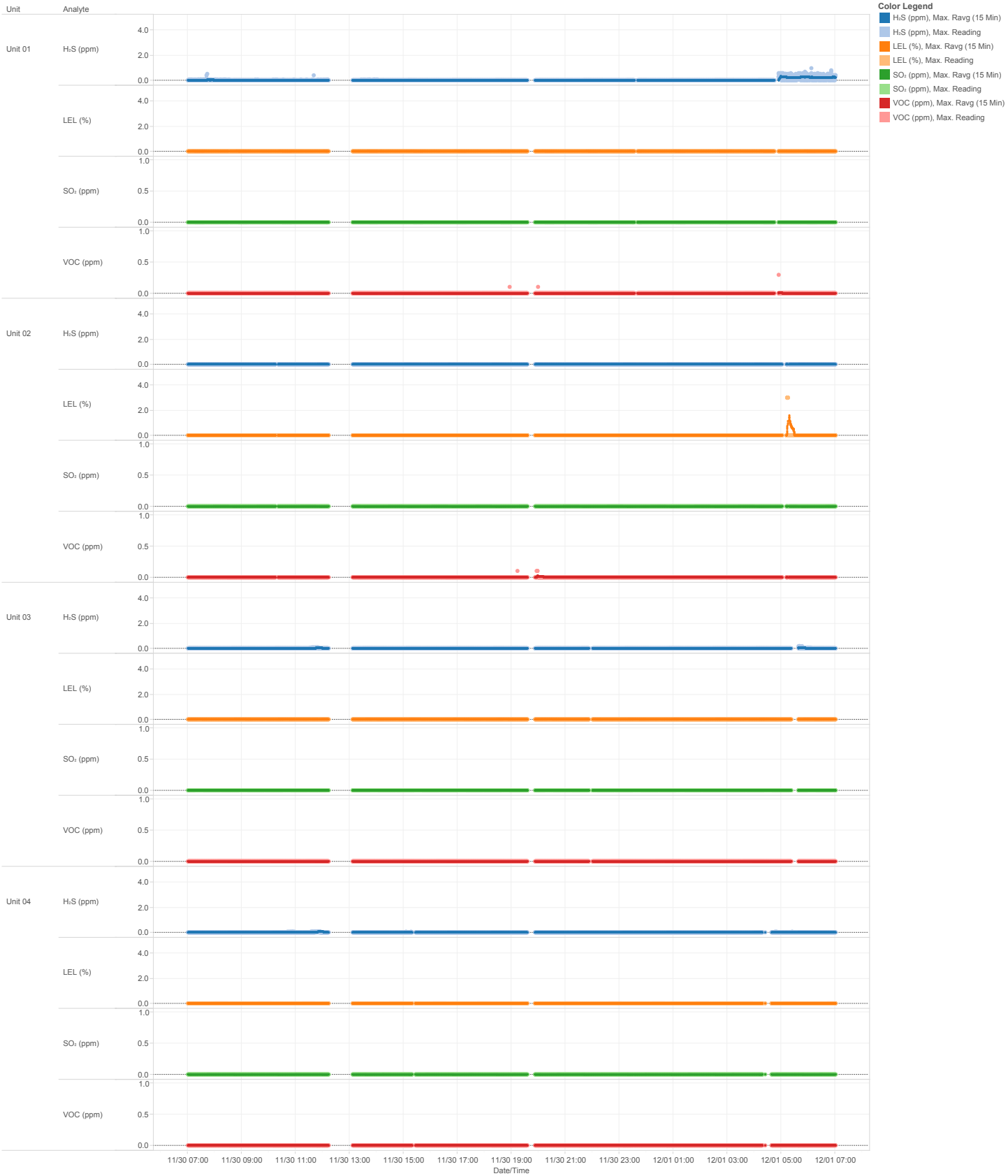
AreaRAE and AM510 Locations

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

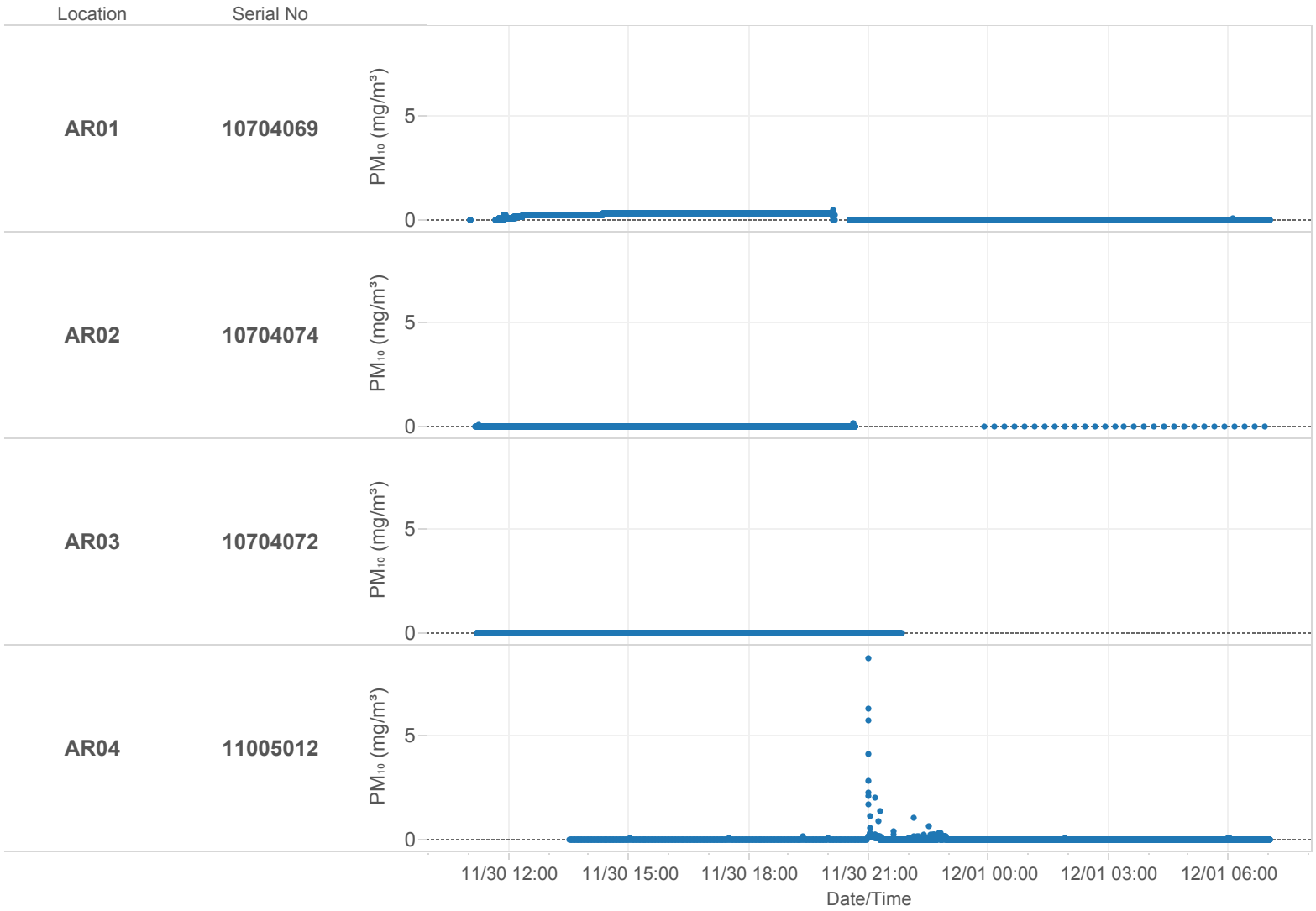
PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *11/26/2014 11:37:30 AM*

Patriot Environmental
AreaRAE Trend Graphs
11/30/2014 07:00 - 12/01/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental
MISSION INCIDENT
Datalogged AM510 (PM_{10}) Summary
11/30/2014 07:00 - 12/01/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format